DOCUMENT RESUME

ED 271 060 HE 019 441

AUTHOR Rush, Donna Safian; Belock, Shirley
TITLE Ethnicity, Academic Skills and Nursing Student Achievement.
PUB DATE [86]
NOTE 21p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Academic Ability; *Academic Achievement; *Admission Criteria; *Certification; *College Programs; Competence; Grade Point Average; Higher Education; Licensing Examinations (Professions); *Nursing Education; *State Standards
IDENTIFIERS *Florida International University

ABSTRACT

The study addressed the effect of admission criteria used by the School of Nursing at Florida International University and how they related to student success in completing the nursing program, passing the state licensure examination, and becoming registered nurses (RN). Attention was focused on the use of the state-instituted College Level Academic Skills Test (CLAST) as a mandatory requirement for admission to the junior year in a state university. The CLAST Examination assesses the ability of the student to read comprehensively, to write a sentence clearly and concisely, and to conceptualize and analyze at a basic level. The effect of CLAST scores on the success rate of nursing students and graduates was evaluated, along with students' grade point average, ethnicity, and whether the student was born in the United States. Further attention was directed to the level of academic skills such as reading, writing, and mathematics that students need prior to enrolling in nursing studies. The study population consisted of 55 students admitted to the program in 1983. Findings include: scoring high on CLAST was linked to scoring high on the licensure exam; grade point average and licensure exam scores were correlated; and the older the student, the higher the CLAST score, the licensure exam score, and grade point average. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED271060

ETHNICITY, ACADEMIC SKILLS AND NURSING STUDENT ACHIEVEMENT

by

Donna Safian Rush, R.N., M.S.N.
Assistant Professor of Nursing
School of Nursing
Florida International University

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Shirley Belock
Donna Rush

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

and

Shirley Belock, R.N., Ed.D.
Professor of Nursing
School of Nursing
Florida International University

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

HE 019 441

ETHNICITY, ACADEMIC SKILLS AND NURSING STUDENT ACHIEVEMENT

Introduction:

This study addressed the significance of the admission criteria used by the School of Nursing at Florida International University and how it related to the success of students in completing the nursing program, passing the state licensure examination and becoming registered nurses (RN).

In an effort to upgrade the educational standards of public university students in Florida, and to ensure that students had the necessary skills to continue and to be successful in a university setting, the State instituted the College Level Academic Skills Test (CLAST) in 1984 as a mandatory requirement for admission to the junior year in a state university. This test examined student achievement in the areas of computation (math), reading, writing and essay writing. In order to enter the junior year at any Florida public university, the test had to be passed with a minimum score of 260 out of a maximum score of approximately 400 (this total varies somewhat each time the examinations are given) in each of the areas of computation, reading, and writing, and a score of four (out of a possible eight) in essay writing. (These scores will be raised by a phase-in process, to 295 and five respectfully by 1989) (Florida Department of Education, 1984).

The completion of the CLAST exam is a new requirement. Until this past year, students entering the junior level at Florida International University were not required to take the CLAST examination. They had been requested to do so on a voluntary basis, but many students chose not to take the exam, others who did take the exam did so with very little preparation before hand. Thus, admission criteria for the first nursing

class in 1982 did not include the CLAST scores. Students were admitted if they had an earned grade point average (G.P.A.) of 2.5 on a 4.0 scale, and had completed the necessary prerequisite science courses with a grade of C or better.

Currently to be admitted to the University and, subsequently, to the School of Nursing, prospective students have to meet the following criteria: 1) a grade point average (GPA) of 2.5 on a 4.0 scale, 2) completion of all pre requiste science courses with a grade of C or better, and, 3) earn a satisfactory score on the College Level Academic Skills Test (CLAST). A satisfactory score is one that is determined by the Board of Regents of the Florida State University System.

The CLAST Examination tests the ability of the student to read comprehensively and to write a sentence clearly and concisely. The ability to conceptualize and to analyze at a basic level appears to be tested by computation and essay portions of the examination.

Sixty-five generic students, i.e., those who were not registered nurses, were admitted in August 1982. Of these sixty-five students admitted, forty-nine graduated in April 1984. This demonstrated an attrition rate of twenty-five percent. Of the forty-nine graduating and sitting for the nursing licensing examination, sixty-nine percent passed and became registered nurses. Sixty-nine percent represented a less than desirable passing rate as a school of nursing in the State of Florida must have at least eighty percent passage to remain in good standing with the Board of Nursing.

After recieving the results, the School of Nursing analyzed the graduate's records and other data to determine where the problem lay. The major factor found in the data of those students who had failed appeared to be the ethnicity of the student. Upon further analysis, as shown in

Table I, those individuals with foreign backgrounds had the most failures in the program, as well as the most failures on the licensing examination.

In 1983 the school of Nursing admitted a second class of fifty-eight generic students. Thirty-four of these students graduated in April 1985. This class had a much higher attrition rate than the previous class. The attrition rate was forty-one percent. However, the passing rate for this group taking the licensing examination was eighty-eight percent. To date, the four graduates failing the exam have not contacted the School so their characteristics cannot be used to determine whether there is any similarity with the first class.

In reviewing the data collected on the most recent graduating class the School noted that ethnicity was still a major indicator of the ability to successfully complete the program and to pass the licensing exam. However, in further purusing the data, CLAST scores appear to be the most predictive of the ability to graduate from the program. Of interest is the fact that the foreign born student, regardless of ethnicity, had the lowest CLAST scores, even where the primary language of the student was english.

The forty-five students in the class of 1985 with a combined average score of 290 or above in reading, writing and computation, and a minimum of four on the essay, had no difficulty earning a passing grade in nursing courses and graduating with the Bachelor of Science in Nursing Degree. The classes in the program, have shown that the failure rate has been exclusively with those having earned CLAST scores below 290 composite average and less than four on the essay.

The CLAST exam is now fully implemented. This implementation means that new or prospective students earning less than the required entering score on the CLAST exam are prevented from enrolling in the

TABLE 1

OVERVIEW OF ADMITTED NURSING STUDENTS' ETHNICITY, ATTRITION AND PASSING RATES FOR 1984 AND 1985

	1984			1985		
	Admission	Graduation (attrition percent)	Passing RN exam (percent passing)	Admission	Graduation (attrition percent)	Passing RN Exam (percent passing)
ETHNICITY						
Asian	5	2 (60)	0 (00)	6	4 (34)	4 (100)
Black	12	11 (08)	5 (46)	7	1 (86)	1 (100)
Hispanic	16	9 (44)	5 (55)	16	7 (56)	5 (71)
White	32	27 (16)	24 (88)	29	22 (22)	20 (91)
TOTAL	65	49 (25)	34 (69)	58	34 (41)	30 (88)
BIRTH PLACE						
USA	40	33 (18)	26 (79)	41	25 (37)	23 (89)
Non USA	19	16 (15)	8 (50)	17	33 (47)	8 (89)
Unknown*	6					
HIGH SCHOOL EDUCATION						
USA	48	40 (17)	30 (75)	48	31 (34)	28 (90)
Non USA	11	9 (19)	4 (44)	10	3 (70)	2 (33)

* Records or data unavailable

University. Prospective students are allowed to repeat the examintion and are admitted if they successfully pass each section with at least 260 in reading, writing and computation and a score of four on the essay portion of the exam.

The School of Nursing studied the possibility of an entrance requirement of a composite average of 290 for scores earned in computation, reading and writing. The rationale for this action was that students admitted with scores below 290 were being set up for failure. It seems that students scoring below 290 do not have the necessary skills to be successful. The School of Nursing does not have the resources to assist these students to attain these skills. However, the University and the community colleges do offer such classes, and with the nursing school's recruiter/advisor's assistance, students are referred to the necessary remedial classes.

A major question still remaining was whether Clast scores have any correlation with scores received by graduate nurses on the licensure examination. The most recent graduates sat for the licensure exam in July 1985. The overall result of the School's graduates was eighty-eight percent passage.

REVIEW OF THE LITERATURE

A review of literature revealed limited information on CLAST type exams and was void of data that related CLAST to the nursing licensure exam. further investigation did demonstrate that the variables of ethnicity, age, capacity to abstract, Scholastic aptitude Scores, G.P.A., National League for Nursing scores on achievement tests were used in predicting success on the nursing licensure exam.

Halprin (1984) studied a predominatly black baccalaureate nursing school in a private college. She looked at the students' high school grade

point averages, Scholastic Aptitude Test's verbal and quantitative scores, and National League for Nursing pre-nursing examination scores. Discriminante analysis of these predictors, plus college grade point averages demonstrated a correlation between those who passed and those who failed the nursing licensure exam.

A recent study by Sharp (1984) at a university in Tennessee, was conducted to determine whether any one of seven selected variables, or a combination of the variables, were predictive of performance on the nursing licensure exam. The selected variables were: high school grade point average, the college of nursing's grade point average, and the American College Test Assessment standard; scores in english, mathematics, social studies, natural sciences and composite. Data utilized was from graduates of the baccalaureate program for the years 1977 through 1979. The selected variables found to be predictive of the nursing licensure exam were grade point averages, and standard achievement scores in mathematics and natural sciences.

Another similar study by Rose (1983) looked at the relationships between age, American College Testing (ACT) scores and college grade point averages to the results on the nursing licensure exam. She found there was a significant negative correlation between the ACT scores and age. The proportion of older students who graduated and passed the licensure examination were significantly higher than the proportion of younger students. The two admission procedures used, i.e., ACT and GPA, resulted in similar rates for graduation and passage on the licensure exam. Age and ACT scores were positively correlated with the licensure exam scores.

Data on all graduates from 1970 through 1976 from a nursing school in southwest Virginia were analyzed by Wolf and Bryant (1983). The

school achievement test and the Scholastic Aptitude Test (SAT) were used to determine if there was a relationship between performance on the two exams and the nursing licensure examination scores. Wolfe and Bryant concluded that licensure exam results on medical, surgical and obstetrical portions depended on mastery of the subject matter and correlated positively with National League for Nursing Achievment Test results. However, performance on the psychiatric and pediatric portions, which measured deductive ability as well as content, correlated with the SAT results.

The ability of a student to use abstract and deductive thinking plays a major role in student success. Jean Piaget, a cognitive psychologist hasstudied the ability to deduct, and use abstract thinking. According to Piaget, an individual moves through several developmental stages before reaching adulthood and full cognitive ability in western cultures (Adams and Macione, 1983, p.65).

In western society, adolescents from age twelve to fifteen years begin to demonstrate the intellectual capacity for symbolic logic in thinking about concepts and ideas. However, in more primitive cultures, this ability to abstract was less necessary and therefore may not be evident, but it can be developed. Unlike its concrete predecessor, this stage involves a manipulation of principles and the construction and formulation of theoretical and conceptual abstractions. Such as mathematical ability, particularly geometry, and creative writing such as essay, utilize abstract thinking (Adams and Macione, 1983).

Abstract and creative thinking were used in the curriculum design of one nursing school (Koehler, 1984). The Department of Nursing at California State University revised their curriculum to allow students to become more independent learners. The courses were designed in modular

format which allowed students to move from concrete to abstract material as they achieved mastery. Faculty expectations were that students would display creativity and abstract ability once they felt secure with the assigned learning. Faculty also believed that students would learn flexibility and independence, which were skills needed to pass the nursing licensure exam. One-third of the students completed the old curriculum (standard didactic instruction) and two-thirds ability once they felt secure with the assigned learning. Faculty also believed that students would learn flexibility and independence, which were skills needed to pass the nursing licensure exam. One-third of the students completed the old curriculum (standard didactic instructioon) and two-thirds completed the new curriculum. Results showed that faculty expectations were not met. failure on the licensing examination was higher for students in the new curriculum.

A literature review on CLAST produced the following information about the examination. The 1979 Florida Legislature Chapter 79-222 charged the State Department of Education with the responsibility for 1) compiling a list of communication and computation skills associated with successful student performance in baccalaureate programs at public universities, 2) approve tests to measure achievement of these skills and 3) set performance standards. The 1982 Florida Legislature mandated the use of scores on the test as a prerequisite for an Associate of Arts degree, or admission to upper division status in a state university (Walsh, 1985).

Validity of CLAST, as a measure of achievement of academic skills, was established by following a plan for developing and selecting items. Content and testing specialists judged the adequacy of the items for measuring the skills, and the plan for selecting items ensured that each form of CLAST was representative of the domain of skills tested. Given

the specifications and conditions of administration, interpretation, scoring, calibration methods, score reliability, item bias prevention and item analysis, the test has, from its inception, met the requisites for a valid and reliable standardized test (Walsh, 1985).

In validiating the CLAST for use as an admission tool, Miami-Dade Community College investigated whether a combination of freshman and sophomore grades and student scores on the CLAST would be a better predictor of student academic success at the four year level than CLAST scores alone. In the absence of data to determine predictive validity of CLAST, college performance of students with a high grade point average from high school and scores on the Comparative Guidance Placement test were analyzed. The study concluded that achievement test results were not better predictors of over-all success than previous academic performance, and that the use of CLAST results alone will probably lead to erroneous admission decisions (Walsh, 1985).

STATEMENT OF HYPOTHESES

Based upon the problem statement and the review of the literature, the following hypotheses were formed:

1. Nursing students with a score of less than 290 on reading, writing, and computation and less than four on essay will fail to complete the nursing program more frequently than those student with scores of 290 or above and four or more on the essay.
2. Graduate nurses with CLAST scores below a composite average of 290 in reading, writing and/or computation and less than four on the essay will be less likely to pass the nursing licensure exam than those with 290 and above and four or more on the essay.
3. The ethnicity of the nursing students at Florida International University will be a factor in successfully completing the nursing

program.

4. The ethnicity of the graduate nurse will be a factor in the ability to pass the state licensure for registered nurse licensure at Florida International University.
5. Nursing graduates who were born and received their basic education in a foreign country will be more likely to fail the nursing licensure examination than nursing graduates born and receiving basic education in the United States.

OPERATIONAL DEFINITIONS

1. Basic Education: Graduating from a high school or its equivalent.
2. CLAST Scores: Scores earned on the standardized tests administered by the Florida public colleges and universities to all students earning an Associate in Arts degree and/or entering the junior year at a public university.
3. Ethnicity: An individual's identification of self as black, asian white of hispanic.
4. Foreign Students: Students born in another country and completing high school or its equivalent outside the U.S.A.
5. Grade Point: Determined by changing the letter grade submitted by faculty to a numerical equivalent as determined by college policy, e.g., A equals 4.0, A- equals 3.7, B+ equals 3.3, B equals 3.0, B- equals 2.7, C+ equals 2.3, etc.
6. Grade Point Average: Determined by adding the number of grade points for all courses taken for a letter grade and dividing by the number of credits attempted by the student.
7. Nursing Course Grade: The grade determined by an individual nursing faculty member based on criteria published by that faculty member at the beginning of the course.

8. Examination for Registered Nurse Licensure: A nationally prepared examination administered by the Florida State Board of Nursing to graduates from approved schools of nursing. The examination tests minimum nursing competencies of graduates. The examination must be passed before the graduate nurse can practice as a registered nurse.
9. Passing Rate for Registered Nurse Licensure Examination: Passing rate has been established to be 1600 or above in the State of Florida.

SIGNIFICANCE OF THE STUDY

This study addressed the issue of whether CLAST scores were predictors of academic success for students seeking a baccalaureate degree in nursing and for their ability to pass the examination for registered nurse licensure on their first attempt.

Students' G.P.A., ethnicity, and place of birth (in or outside of the U.S.A.) were addressed to determine whether these factors had any bearing in the success rate of nursing students and graduates.

The study was conducted to assist the School of Nursing in determining the type of students who would be successful in pursuing an academic path to professional nursing, i.e., at the baccalaureate level. The study further identified the level of academic skills such as reading, writing, and math that may be necessary for students prior to their entrance into the nursing program in order for them to successfully completing the nursing program and, subsequently, to pass the necessary examination for registered nurse licensure.

SAMPLE POPULATION

The sample population consisted of nursing students graduating from the School of Nursing in 1985. The sample population consisted of

fifty-five students admitted to the program in 1983. The sample population was ethnically mixed, with minorities making up approximately fifty percent of the group. Minorities included were identified as black, Hispanic and Asian.

INDEPENDENT VARIABLE

The independent variable was the scores earned by subjects on the CLAST examination.

MODERATOR VARIABLES

Moderator variables included the ethnicity of the student, whether the student was born in and completed basic education in another country and the student's grade point average.

DEPENDENT VARIABLES

The dependent variables consisted of the success of students in pursuing the baccalaureate degree and the ability of the graduate nurse to pass the registered nurse licensure examination on the first attempt.

PROCEDURE

Student files available in the School of Nursing for individuals entering the nursing program in 1983 were reviewed. To aid in controlling other variables that might bias the study the following types of students were excluded from the study:

1. Students transferring from another upper division university with more than ninety credits.
2. Students having earned a baccalaureate or higher degree.
3. Students not completing the CLAST examination because of an earlier admission to the University when the examination was not required.

Information from student files included each student's G.P.A. earned by the student at the time of admission to the nursing program; The

students ethnicity and age as identified by the student on the admission form; and, the scores earned on the CLAST as indicated on the individual's University transcript.

The scores from the nursing licensure exam were obtained by direct contact with 1985 graduates from the School of Nursing. Individual graduate socres were not available from the State Board of Nursing. The State Board of Nursing would not release them due to the students right to privacy. Therefore, each graduate was individually contacted by phone and asked for their score on the licensure exam.

DATA ANALYSIS

The collected data was analyzed using the Pearson Product Moment Correlation Coefficient Index (Pearson r). The Pearson r was used to summarize the magnitude and direction of the relationships between the identified variables.

When determining the overall correlation of the variables of the licensure examination (N-CLEX), CLAST and GPA all three variables were found to be significantly correlated, i.e., .6811 for N-CLEX and CLAST ($p<.005$); .7270 for N-CLEX and G.P.A. ($p<.005$); and, .4954 for CLAST and G.P.A. ($p < .01$). See Table 2.

The correlations for students born and completing high school in the United States versus the foreign born and educated students could not be shown to differ. (G.P.A. andf CLAST were not correlated because of the small sample size.) See Table 3.

In correlations by ethnicity, the CLAST and N-CLEX, and G.P.A. and N-CLEX were not correlated for foreign born due to the small sample size. The correlations for white and minorities did not differ, however, the mean CLAST for white was higher than that for the foreign born at .0031 level of significance. See Table 4.

In analyzing correlations by sex, the number of males (N = 4) was too small to show anything. However, all pairs were significant for females at the .005 level of significance. See Table 5.

Age does help to predict success on the N-CLEX at .00368 level of significance, on the CLAST at .00263 level of significant and the G.P.A. at .0040 level of significance. Even after adjusting for age, N-CLEX and CLAST, and N-CLEX and G.P.A. were significantly correlated. However, after adjusting for age, G.P.A. and CLAST were no longer correlated. See Table 6.

When determining the relationship between nursing licensure (N-CLEX) and CLAST scores, it was found that there was sufficient evidence to show they were directly correlated, $r = .69$ ($p<.01$). The relationship between N-CLEX and G.P.A., were also significant, $r = .73$ ($p<.01$). Further, the relationship between CLAST and G.P.A. was $r = .50$ ($p=.01$). These results are summarixed in Table 7.

DISCUSSION AND CONCLUSION

The issue of predicting success of nursing students on the nursing licensure exam has been a critical and timely dilemma. School's of nursing have used criteria such as G.P.A., age of student, S.A.T. scores, various achievement tests, and the teaching of critical thinking as variables to detemine whether there was any correlation with the licensure exam scores.

CLAST is a new test that has been used in Florida colleges since 1982. The Florida Legislature mandated its use as a requisite for an Associate in Arts Degree, and/or admission to upper division status in state universities.

The literature on the CLAST exam and its ability to predict that which it was intended to do has been thus far scarce. In searching for predictive

measures of the licensure exam success, the question was asked whether CLAST scores were predictors of academic success for students seeking a baccalaureate degree in nursing, and whether CLAST scores could predict a student's ability to pass the licensure exam on their first attempt.

The Pearson r showed that CLAST scores do correlate positively with licensure exam scores. That is, the greater the CLAST score, the greater the licensure exam score.

Further analysis using the Pearson r demonstrated that G.P.A. and licensure exam scores were positively correlated, which gives further support to Halprin's (1984) study, as well as those conducted by Sharp (1984) and Rose (1983).

Correlation coefficient analysis for ethnicity, sex, and age, revealed age to be highly correlated with CLAST, G.P.A. and licensure exam scores. That is, the older the student, the higher the CLAST score, the licensure exam score and the G.P.A.

Ethnicity and sex did not reveal any correlations, but this is likely to be due to the small sample size, i.e., only 4 males in the sample population.

It was intended that the licensure scores of the graduates would be obtained through the Florida State Board of Nursing. In this manner the research presented would have been more complete and accurate. However, the scores would not be released. The writers were informed that releasing the scores of individual students constituted breaching of confidentiality and right to privacy. Therefore, in order to obtain the scores for this study, each individual graduate was phoned and asked for the score received on the licensure exam. Seven of the students were unable to remember their scores and gave approximate guesses. Therefore, the findings presented in this paper must be used as approximations, not as hard data.

Another limitation of this study was the small sample size, N = 55 of students entering the program and N = 34 for those graduating from the program. The limited sample size was due to the newness of the CLAST exam, and the use of only one school of nursing for the study.

Recommendations are that 1) further research should be done in this area, 2) the study should be enlarged to include more schools of nursing in Florida, 3) the results found in Florida should be compared with other states requiring similar testing for admission to the junior year, 4) investigations should be conducted to determine which of the variables isolated were most predictive of nursing student success and, finally, 5) whether CLAST, or similar tests, are predictive of success in completing nursing school requirements and passing the nursing licensure exam.

TABLE 2
OVERALL CORRELATIONS

	N-CLEX	CLAST
CLAST	.6911 (28) (p< .005)	X
GPA	.7270 (28) (p< .005)	.4954 (25) (p< .01)

TABLE 3
CORRELATIONS BY COUNTRY

	USA (n = 21)		Non USA (n = 9)	
	N=CLEX	CLAST	N-CLEX	CLAST
CLAST	.6563 (p < .05)	X	.6458 (p < .05)	X
GPA	.7094 (p < .005)	.4930 (p < .025)	.7557 (p< .01)	.3913 NS

TABLE 4
CORRELATIONS BY ETHNICITY

	White (n = 19)		other (n = 13)	
	N-CLEX	CLAST	N-CLEX	CLAST
CLAST	.5927 (p<.005)	X	.5626 (p<.025)	X
GPA	.6723 (p<.005)	.3870 NS	.7838 (p<.005)	.3905 NS

TABLE 5
CORRELATIONS BY SEX

	Female (n=28)		Male (n=4)	
	N-CLEX	CLAST	N-CLEX	CLAST
CLAST	.6313 ($p<.005$)	X	.6019 NS	X
GPA	.7539 ($p<.005$)	.5729 ($p<.005$)	.5346 NS	.0746 NS

TABLE 6
PARTIAL CORRELATIONS--EFFECT OF AGE

	N-CLEX	CLAST
CLAST	.5370 ($p<.005$)	X
GPA	.6010 ($p<.005$)	.2340 NS

TABLE 7
SUMMARY

	r	Significant Level ($p<$)
N-CLEX and CLAST	.69	.01
N-CLEX and GPA	.73	.01
CLAST and GPA	.50	.01

REFERENCES CITED

Adams, C.G. & Macione, A. (1983). Handbook of Psychiatric Nursing. New York: Wiley Medical.

Questions and Answers about CLAST. (1984-85). Tallehasee, FL: State Department of Education.

Halprin, G. (1984). Predictors of Success in Nursing School and on State Board Examinations in a Predominately Black Baccalaureate Nursing Program. Journal of Nursing Education 23,147-50.

Koehler, M. (1984) Evaluating a Curriculum. Journal of Nursing Education 21,1-39.

Rose, S. (1983). Relationship of Age, American College Testing Scores, Grade Point Average and State Board Examination Results. Research in Nursing Health. 6, 69-73.

Sharp, T.G. (1984). An Analysis of the Relationship of Seven Selected Variables to State Board Test Pool Examination Performance of the University of Tennessee, Knoxville, College of Nursing. Journal of Nursing Education 23, 57-63.

Walesh, S.L. (1985) CLAST Study Results. in Planning and Analysis, Miami, Florida: Florida International University, Division of Planning and Analysis.

Wolfe, L.M. & L. W. Bryant. (1983). A Causal Model of Nursing Education and Board Examination Scores. Nursing Research 28, 311-316.

Wright, T. (1983) Should One Variable (CLAST) Be Used to Determine Entrance to Upper Division at the State University in Florida? (Report No. 83-23). Research Report 143, 110.